IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Per Beming, *et al.*	§	Group Art Unit:	2462
Application No.	10/595,312	§	Examiner:	Duong, Christine
Filed:	04/06/2006	§	Confirmation No:	7185

Attorney Docket No: P17894-US1
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For: Coordinated Data Flow Control and Buffer Sharing in UMTS

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APPEAL BRIEF SUBMITTED UNDER 35 U.S.C. §134

This Appeal Brief is submitted to appeal the decision of the Primary Examiner set forth in a Non-Final Official Action dated August 18, 2010, finally rejecting claims 13-17, which are all of the pending claims in this application.

A prior appeal of a final rejection in this application was filed on June 1, 2010; the Examiner did not answer that appeal, but reopened prosecution on the basis of the claim rejections presented herein. Whereas fees for a Notice of Appeal and Appeal Brief were paid for the previously-filed appeal, which the Examiner did not answer, no fees are due for the present appeal. For any additional fees, due to an increase since the date of the prior appeal, the Commissioner is authorized to charge Deposit Account No. 50-1379.

Real Party in Interest

The real party in interest, by assignment, is: Telefonaktiebolaget LM Ericsson (publ)
SE-164 83
Stockholm, Sweden

Related Appeals and Interferences

None.

Status of Claims

Claims 1-12 and 18 were previously cancelled and are not appealed; claims 13-17 remain pending in the application.

Status of Amendments

The claims set out in the Claims Appendix include all entered amendments. No amendment has been filed subsequent to the final rejection.

Summary of Claimed Subject Matter

Claim Element	Specification Reference
13. A control method for regulating the flow of data between a first transmitting radio network node and a second transmitting radio network node in a radio transmission network, comprising the steps of:	Page 18, line 21, *et seq.*
said second transmitting radio network node receiving data from said first transmitting radio network node to be forwarded to plural user entities via an air interface; wherein:	Figure 12, Step 90
the first transmitting radio network node sends a capacity request to the second transmitting radio network node requesting the second transmitting radio network node for permission to send an indicated number of data units that are pending in the first transmitting radio network node; and,	Figure 12, Step 92
the second transmitting radio network node, in response to the capacity request, sends an allocation frame to the first transmitting radio network node, said allocation frame indicating the number of data units the first transmitting radio network node is given permission to transmit, this latter	Figure 12, Step 120

number being referred to as credits;	
wherein the second transmitting radio network node, if buffer resources for storing of data units at the second transmitting radio network node are limited for each data flow between the first and second transmitting radio network nodes, performs the steps of:	Figure 11, Step 82; Page 18, lines 21-22
counting the instantaneous number of requested data units in each data flow to obtain a total number of requested data units;	Figure 13, Step 131
computing the total number of credits to be granted in each data flow by subtracting from a target buffer filling level for the total number of data flows the total number of data units currently stored in each of the buffers and the total number of credits previously given but not yet received; and,	Figure 14, Step 140
distributing the total number of credits proportionally to radio channel qualities indicated by said user entities.	Figure 12, Step 120

Claim Element	**Specification Reference**
15. A control method for regulating the flow of data between a first transmitting radio network node and a second transmitting radio network node in a radio transmission network, comprising the steps of:	Page 18, line 21, *et seq.*
said second transmitting radio network node receiving data from said first transmitting radio network node to be forwarded to plural user entities via an air interface, wherein:	Figure 12, line 14, *et seq.*
the first transmitting radio network node sends a capacity request to the second transmitting radio network node requesting the second transmitting radio network node for permission to send an indicated number of data units that are pending in the first transmitting radio network node; and,	Figure 12, Step 92
the second transmitting radio network node, in response to the capacity request, sends an allocation frame to the first transmitting radio network node, said allocation frame	Figure 12, Step 120

indicating the number of data units the first transmitting radio network node is given permission to transmit, this latter number being referred to as credits; and,	
distributing the number of credits given by the second transmitting radio network node proportionally to radio channel qualities indicated by said user entities to which the second transmitting radio network node is scheduling radio transmission of data units.	Figures 13 and 14 Page 20, line 7, *et seq.*

Claim Element	**Specification Reference**
16. A radio network node for regulating the flow of data from a transmitting node, comprising:	Figure 5; Page 9, line 1, *et seq.*
a buffering resource;	Figure 5, elements 9 Page 9, line 6
a capacity allocation device for allocating individual amounts of user data to individual user entities;	Page 9, line 2, *et seq.* Figure 5, element 23
a flow control protocol and a scheduler;	Figure 5, element 16 Page 9, line 5
wherein the capacity allocation device comprises a counter for keeping a running count of the instantaneous number of outstanding credits, outstanding credits being defined as the number of data units that the allocation device has permitted the transmitting node to send, although the corresponding number of data units has not yet arrived at the radio network node;	Figure 5, elements 29 Page 9, line 15
a distribution device adapted to distribute the total number of credits given by the radio network node proportionally to radio channel qualities indicated by said user entities to which the scheduler is scheduling radio transmission of data units.	Page 12, line 23, *et seq.*

The specification references listed above are provided solely to comply with the USPTO's current regulations regarding appeal briefs. The use of such references

should not be interpreted to limit the scope of the claims to such references, nor to limit the scope of the claimed invention in any manner.

Grounds of Rejection to be Reviewed on Appeal

1.) Whether claims 13 and 14 are unpatentable, under 35 U.S.C. §103(a), over what the Examiner has deemed as Applicant's "Admitted Prior Art" ("APA") in view of Calvignac (U.S. Patent No. 5,784,698) and Liu, *et al.* (U.S. Patent Publication No. 2004/0062192 A1); and,

2.) Whether claims 15-17 are unpatentable, under 35 U.S.C. §103(a), over APA in view of Liu.

Arguments

The Examiner first rejected claims 13 and 14 as unpatentable over APA, Calvignac and Miyoshi, *et al.* (U.S. Patent Publication No. 2003/0087662 A1), and claims 15-17 as being unpatentable over APA and Miyoshi, in a Non-Final Office Action dated April 2, 2009. After arguments were submitted on July 2, 2009, traversing those grounds of rejection, the Examiner issued a Final Office Action, maintaining the rejections, on October 19, 2009. The Applicants then filed a Request for Reconsideration on December 21, 2009. The Examiner again maintained the rejections in an Advisory Action dated January 12, 2010. The Applicants then appealed the rejections, presenting essentially the same previously-submitted arguments in an Appeal Brief filed on April 19, 2010.[1] The Examiner, rather than responding to Applicants' Appeal Brief, has withdrawn the prior basis for rejecting the claims and re-opened prosecution. The Examiner's "new" basis for rejecting the claims, however, merely substitutes the teachings of Liu for the previously-asserted teachings of Miyoshi. For the reasons that follow, Liu fails to cure the deficiencies in the teachings of Miyoshi now apparently acknowledged by the Examiner.

[1] An Amended Appeal Brief was filed on June 1, 2010, to respond to a Notice of Non-Compliant Brief.

1.) CLAIMS 13 AND 14 ARE PATENTABLE OVER APPLICANT'S "ADMITTED PRIOR ART" ("APA") IN VIEW OF CALVIGNAC AND LIU

Claim 13 recites:

> 13. A control method for regulating the flow of data between a first transmitting radio network node and a second transmitting radio network node in a radio transmission network, comprising the steps of:
>
> said second transmitting radio network node receiving data from said first transmitting radio network node to be forwarded to plural user entities via an air interface; wherein:
>
> the first transmitting radio network node sends a capacity request to the second transmitting radio network node requesting the second transmitting radio network node for permission to send an indicated number of data units that are pending in the first transmitting radio network node; and,
>
> the second transmitting radio network node, in response to the capacity request, sends an allocation frame to the first transmitting radio network node, said allocation frame indicating the number of data units the first transmitting radio network node is given permission to transmit, this latter number being referred to as credits;
>
> wherein the second transmitting radio network node, if buffer resources for storing of data units at the second transmitting radio network node are limited for each data flow between the first and second transmitting radio network nodes, performs the steps of:
>
> counting the instantaneous number of requested data units in each data flow to obtain a total number of requested data units;
>
> computing the total **number of credits** to be granted in each data flow by subtracting from a target buffer filling level for the total number of data flows the total number of data units currently stored in each of the buffers and the total **number of credits** previously given but not yet received; and,
>
> distributing the total **number of credits proportionally to radio channel qualities indicated by said user entities**. (emphasis added)

As first noted in Applicants' response to the Non-Final Office Action dated April 2, 2009, the control method for regulating the flow of data between first and second transmitting radio network nodes recited in independent claim 13 (as well as independent claims 15 and 16) is characterized, in part, by distributing the total number of transmission credits to be granted to the user entities ***proportionally to the radio channel qualities indicated by the user entities***. For claim 13 (as well as claims 15 and 16), the Examiner has repeatedly acknowledged that Applicant's Admitted Prior Art (APA) and Calvignac ***do not*** disclose distributing a total number of credits (for transmission of data

units) proportionally to radio channel qualities indicated by the user entities. (See: Office Action dated April 2, 2009; Page 10, lines 1-4, and page 12, lines 4-7; and, Office Action dated August 18, 2010; Page 5, lines 10-11) To overcome that deficiency in the prior art, the Examiner now looks to the teachings of Liu, stating that Liu discloses in paragraph 0038:

> "After the transmit power for each wireless is optimized, **the base station may then select the affordable data rates for each wireless unit** according to the allocated power. As a result, wireless units having more attractive CQI values may be given preferential treatment. More particularly, the wireless units having more attractive CQI values may be **allocated more power** from the base station's resources to transmit data. In contrast, wireless units having less attractive channel conditions may be **allocated less power** from the base station's resources to transmit data." (emphasis added)

The Applicants believe the Examiner reads too much into the teachings of Liu. The Applicants' invention is directed to **regulating the flow of data** between a first transmitting radio network node and a second transmitting radio network node, wherein the second transmitting radio network node receives data from the first transmitting radio network node **to be forwarded to plural user entities via an air interface**; the method of regulating requires:

> counting the instantaneous number of requested data units in each data flow to obtain a total number of requested data units;
>
> computing the total number of credits to be granted in each data flow by subtracting from a target buffer filling level for the total number of data flows the total number of data units currently stored in each of the buffers and the total number of credits previously given but not yet received; and,
>
> distributing the total number of credits proportionally to radio channel qualities indicated by said user entities.

Nothing that the Examiner has pointed to in the teachings of Liu involves a credit-based system for regulating the flow of data between first and second radio network nodes for data **to be forwarded to plural user entities via an air interface**. More particularly, nothing in Liu relates to "distributing [a] total number of credits proportionally to radio channel qualities indicated by [ ] user entities." The Examiner merely points to a portion of Liu that describes adjusting **power levels** as a function of CQI values; after selecting such power levels, a base station can then select "affordable data rates for each

wireless unit according to the allocated power." Even if the setting of power levels, or the selection of "affordable data rates," were considered analogous to distributing credits, as presented in claim 13, Liu expressly teaches that the selection of a transmission rate for each wireless unit "is performed in response to the CQI signal(s) of **each** wireless unit," and that "the appropriate data transmission rate for **a** wireless unit [is determined] in view of **its** CQI signal(s)." (See Paragraph 0027, and Step 50 of Figure 1). Thus, even if data transmission rates for multiple wireless units (*i.e.*, "plural user entities" as used in claim 13) is considered analogous to distributing credits to regulate the flow of data in buffers, Liu teaches setting the data transmission rate for each wireless unit as a function of each such unit's CQI values; *i.e.*, there is no **proportional** distribution of data transmission rates as a function of some **total** value.

Furthermore, as those skilled in the art will recognize, setting the transmission rate for each communication terminal according to the downlink channel quality experienced by **each** such terminal does not limit the transmission rate that can be set for **other** terminals; *i.e.*, the transmission rate set for one communication terminal does not limit the transmission rate that can be set for another communication terminal. *In contrast*, the method recited in claim 13 (as well as claims 15 and 16) is directed to managing the limited capacity of a radio network node (*e.g.*, due to limited buffer resources) which are apportioned ***proportionally to radio channel qualities indicated by user entities*** to which data units will be transmitted; *i.e.*, granting more transmission credits to one entity reduces, proportionally, the number that can be granted to another entity. Although Liu describes setting a transmission rate by a base station based on a CQI signal transmitted by different communication terminals, it does not follow that Liu discloses "distributing [a] total number of credits proportionally to radio channel qualities indicated by said user entities;" ***to conclude otherwise is to not read the credit mechanism of Applicants' invention in the context of the claim as a whole***.

Claim 13 concludes with the limitation of: "distributing the **total** number of credits **proportionally** to radio channel qualities indicated by said user entities." (emphasis added). As those skilled in the art will recognize, **if there are a "total" number of credits, and they are distributed "proportionally," then granting more transmission credits to one entity will, *necessarily*, reduce the number that can**

be granted to another entity. The Examiner has not pointed to any such teaching in Liu and, accordingly, claim 13 is not obvious over APA, Calvignac and Liu. Furthermore, whereas claim 14 is dependent from claim 13, and includes the limitations thereof, it is also not obvious in view of APA, Calvignac and Liu.

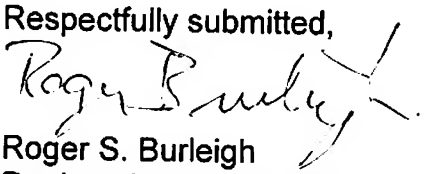
2.) CLAIMS 15-17 ARE PATENTABLE OVER APA IN VIEW OF LIU

Independent claims 15 and 16 recite limitations analogous to those of claim 13 and, thus, they are also distinguishable over APA and the teachings of Calvignac and Liu. Therefore, the Examiner has also not established a *prima facie* case of obviousness for claims 15 and 16 in view of only APA and Liu. Furthermore, whereas claim 17 is dependent from claim 16, and includes the limitations thereof, it is also not obvious in view of the cited prior art.

CONCLUSION

The claims currently pending in the application are patentable over the cited prior art, and the Applicants request that the Examiner's claim rejections be reversed and the application be remanded for further prosecution.

Respectfully submitted,



Roger S. Burleigh
Registration No. 40,542
Ericsson Patent Counsel

Date: January 18, 2011

Ericsson Inc.
6300 Legacy Drive, M/S EVR1 C-11
Plano, Texas 75024

(972) 583-5799
roger.burleigh@ericsson.com

CLAIMS APPENDIX

1-12. (Cancelled)

13. (Previously Presented) A control method for regulating the flow of data between a first transmitting radio network node and a second transmitting radio network node in a radio transmission network, comprising the steps of:

said second transmitting radio network node receiving data from said first transmitting radio network node to be forwarded to plural user entities via an air interface; wherein:

the first transmitting radio network node sends a capacity request to the second transmitting radio network node requesting the second transmitting radio network node for permission to send an indicated number of data units that are pending in the first transmitting radio network node; and,

the second transmitting radio network node, in response to the capacity request, sends an allocation frame to the first transmitting radio network node, said allocation frame indicating the number of data units the first transmitting radio network node is given permission to transmit, this latter number being referred to as credits;

wherein the second transmitting radio network node, if buffer resources for storing of data units at the second transmitting radio network node are limited for each data flow between the first and second transmitting radio network nodes, performs the steps of:

counting the instantaneous number of requested data units in each data flow to obtain a total number of requested data units;

computing the total number of credits to be granted in each data flow by subtracting from a target buffer filling level for the total number of data flows the total number of data units currently stored in each of the buffers and the total number of credits previously given but not yet received; and,

distributing the total number of credits proportionally to radio channel qualities indicated by said user entities.

14. (Previously Presented) The control method recited in claim 13, further comprising the step of limiting the total sum of user data in all data streams to a desired value less than or equal to the total requested number of data units.

15. (Previously Presented) A control method for regulating the flow of data between a first transmitting radio network node and a second transmitting radio network node in a radio transmission network, comprising the steps of:

said second transmitting radio network node receiving data from said first transmitting radio network node to be forwarded to plural user entities via an air interface, wherein:

the first transmitting radio network node sends a capacity request to the second transmitting radio network node requesting the second transmitting radio network node for permission to send an indicated number of data units that are pending in the first transmitting radio network node; and,

the second transmitting radio network node, in response to the capacity request, sends an allocation frame to the first transmitting radio network node, said allocation frame indicating the number of data units the first transmitting radio network node is given permission to transmit, this latter number being referred to as credits; and,

distributing the number of credits given by the second transmitting radio network node proportionally to radio channel qualities indicated by said user entities to which the second transmitting radio network node is scheduling radio transmission of data units.

16. (Previously Presented) A radio network node for regulating the flow of data from a transmitting node, comprising:

a buffering resource;

a capacity allocation device for allocating individual amounts of user data to individual user entities;

a flow control protocol and a scheduler;

wherein the capacity allocation device comprises a counter for keeping a running count of the instantaneous number of outstanding credits, outstanding credits being

defined as the number of data units that the allocation device has permitted the transmitting node to send, although the corresponding number of data units has not yet arrived at the radio network node;

a distribution device adapted to distribute the total number of credits given by the radio network node proportionally to radio channel qualities indicated by said user entities to which the scheduler is scheduling radio transmission of data units.

17. (Previously Presented) The radio network node recited in claim 16, wherein the capacity allocation device comprises a counter for keeping a running count of user data pending in the transmitting node.

18. (Cancelled)

* * *

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None